

## About the researching of Some Innovation Infrastructure models in Azerbaijan agriculture

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**Abstract**

*The paper studies the features of regional marketing infrastructure in the modern transitional period. The new innovative model of agricultural development has been developed in Azerbaijan. To increase the effectiveness of innovative processes proposed a new system of management of Research and Development (R&D) process, which includes: the development of common research and development strategy, funding of a range of the large programs and a system of Research and Development and technical information, accumulating of the international experience, benefits and subsidies that encourage innovative activity of the economic entity. In this article we also paid special attention to such popular method of the agricultural support in many developed countries, as leasing. Leasing carries out several important functions in terms of the organization of agricultural financing and marketing of its products. We analyzed its reproduction function, including the investment-credit and marketing function. The article also studies the problem of preservation and realization of inventories in agriculture. The survey showed that the cost of binding in the working capital generated by the loss of (potential) benefit from the cash turnover.*

**Keywords:**

*Infrastructure, innovation, agriculture, transition period, models, Azerbaijan.*

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### **Introduction**

The first is the provision of resources and investment goods to the agricultural producers and the second is - in the organization of agricultural marketing procedures. So, we analyzed the incentive function of the leasing, which is shown in the accumulation of capital, the implementation of scientific and technological innovation, which together provide the overall growth of agriculture and the country's economy. Also, the regulation function of the leasing is studied, which implies the implementation of common control over the financing and marketing of products and the regulation function arising out of the previous two functions.

One of the key tasks in the framework of the modernization of the country's agricultural policy is the modernization of social and labor relations towards countryside, because the development of agriculture depends on these relations. First, we need a real boost of rural inhabitants' incomes, without which it will continue outflow of rural residents to the city and the marginalization of rural areas.

The article proposes the modernization of social and labor relations in the countryside, which implies the importance for the following activities: the real protection of the human rights and freedoms of the peasants, regardless of whether he is the owner or an employee; the total exclusion of agriculture and life in rural areas from all forms of unpaid work, which directly violate the rights and freedoms of citizens; the gradual elimination of the system of inequality and exploitation prevailing in the agricultural sector of Azerbaijan due to low salary of the rural workers which they are paid less than the city dwellers, including the level of social infrastructure development in rural areas.

### **Discussion**

Presently, the innovation activities mean the successful development of any sector of the economy through the development and implementation of scientific and technological achievements, the creation of new competitive products, the production of which must take place at the level of modern technology to obtain the greatest possible profit.

In a market economy, innovation is an effective mean of competition, since lead to the creation of new needs, to reduce production costs, to the inflow of investments to the discovery and capture of the new markets.

The most important condition of acceleration of the intensification process is the state regulation of economy, which carried out in two main forms: direct government funding or the creation of favorable conditions for those businesses that are actively expanding their research and development activities, introducing advanced equipment and technology to the industry.

An important aspect of the state regulation is to create a system of methods for the stimulating of research and development progress. Since in the transitional period in terms of instability and uncertainty of growth without a strong centralized action can occur a sharp decline in the effectiveness of innovation.

To increase the effectiveness of innovation processes there is a need for a new system of management of research and development process, which should include: the development of common research and development strategy, funding of large programs, a system of scientific and technical information, accumulating international experience, benefits and subsidies that encourage innovative activity of the economic entity.

In developed countries, the state largely controls and determines the development of new forms of research and development progress, and its function is not limited only to micro-economic regulation of the market, although it is an important area of its activity. This control and regulatory function of the central authorities prevents the industry from excessive monopolization, thus contributing to the faster development of innovations.

The modernization of the agrarian sector of Azerbaijan in modern conditions

Considering the problems of modernization of the agricultural sector, we should not forget about such an important factor, as the globalization of the economy, in which most of countries and regions are integrated into a single economic system. Even though globalization has met a significant number of opponents, who see in it only the negative side, it should be noted that to address the many challenges facing modern humanity and all the problems which foreseeable in the near and more distant future, the formation of a global economic system has more positive significance. As countries around the world contributes to the consolidation in the fight against the most important challenges of our time.

Moreover, in the opinion of some authors, globalization of the economy can alleviate the global food crisis and prevent it from the worst form of it- mass starvation and multi-million casualties. However, this requires the development of long-term projections of food supply for the world's population, as well as development programs for the agro-industrial complex and food markets of the countries and regions. Importance in these programs should belong to the exploration and development of resource-saving technologies in all areas related for the food supply of the population.

When we compare our republic with many other developed countries, Azerbaijan has significant advantages in terms of territorial extent, the availability of natural resources, which, while minimizing the negative factors creates quite positive prospects for the successful development of the agricultural sector, and the obtaining of a particular niche at the international level.

Modernization of the agricultural sector at the current stage of development of Azerbaijan should be carried out on the following important areas: production-technological, breeding and genetic, environmental and socio-organizational and managerial innovations. The last two fields have a interest, since their successful implementation depends largely on the actual reform of public policy for the management of agriculture and rural areas.

Leasing performs several important functions in terms of the organization of agricultural financing and marketing of its products. We analyzed its reproduction function, including the investment-credit and marketing function. The first is the provision of resources and investment goods, the second - in the organization of agricultural marketing procedures. So we analyzed the incentive function of the leasing, which is shown in the accumulation of capital, the implementation of scientific and technological innovation, which together provide the overall growth of agriculture and the country's economy as a whole. Also, we studied the regulation function of the leasing, which implies the implementation of common control over the financing and marketing of products and the regulation function arising out of the previous two functions.

Another factor of the modernization of the agriculture may be the development of cooperation in the agricultural sector. The development of cooperatives to help citizens to abandon intermediaries - resellers, who are assigned most of the profits from sales of the farms products. However, it will be easier and the process of selling products through a cooperative marketing structures. Through cooperation the state can solve the problem of farmers with the providing of them soft loans at minimal interest rates. Cooperation of farmers can act as an effective response to the possible arbitrariness on the part of regional and local authorities, protection against criminal organizations, before which the scattered farms in many cases are completely defenseless. Thus, the co-operative structures become an alternative to the old forms of organization of the agricultural industries and effectively operating in the condition of the market economy [9,10,12,13,16].

It should be noted also that for the full-scale modernization it is necessary the solving of the wide range of social problems facing rural agricultural farms of Azerbaijan, the successful development of the agricultural sector depends on solution of these problems.

It is necessary a broad partnership of government agencies, commercial organizations, and public sector towards development of the social infrastructure of the rural areas and improvement of living standards in rural areas.

One of the key tasks in the framework of the modernization of the country's agricultural policy is the modernization of social and labor relations to the countryside, because the development of agriculture depends on these relations. First, we need a real boost of rural incomes, without which it will continue outflow of rural residents to the city, the marginalization of rural areas. [11].

In our opinion, the modernization of social and labor relations in the countryside, which implies the importance for the following activities: the real protection of the human rights and freedoms of the peasant, regardless of whether he is the owner or an employee; the total exclusion of agriculture and life in rural areas from all forms of unpaid work, which directly violate the rights and freedoms of citizens; the gradual elimination of the system of inequality and exploitation pre-

vailing in the agriculture of Azerbaijan due to low salary of the rural workers which they are paid more worst than the city dwellers, including the level of social infrastructure development in rural areas. [8]

One of the priority directions of modernization of the agricultural sector is the improvement of the system of local self-government. It should be noted that the local self-government offers people a real opportunity for organizing and focusing on the targets. At the same time at the settlement level, where the local government by their local character is closest to the population, potentially it has the most ability to carry out such a local policy that is able to satisfy the needs of all participants in social and power relations. According to the concept of subsidiary state, local government should effectively organize the use of public resources and by involving local opportunities should be able to promote the release of public authorities from numerous concerns of the organization of everyday life of people. But in actual practice, the execution of the republican budget carries its own obligations on local governments. As a result, the basic costs of municipalities (85%) are associated with the execution of state powers.

The problem of development of local self-government has its roots in the mistrust of the population to the regional authority, which is designed to tackle the main issues of life of the rural community. Presently a form of citizen participation in local government is largely a formality. The citizen, who lives in a area, has not yet become the main subject of the local self-government of modern Azerbaijan. [14] Citizen's confidence in local authorities will arise only when local authorities will learn how to solve and improve the major social and economic issues. That is why the most acute problem for the functioning of local authorities is to ensure different levels of budgets revenue sources. Endowment of most municipalities, economic helplessness of the settlements mainly affects the efficiency of local government and municipal services as depriving effect to the municipal employees in economic activity and the population - their motivation to actively participate in local self-government. [15]

Innovative development of the agrarian-food sector of the economy is associated with a complex use of the knowledge-intensive production factors that determine the technical and technological, financial and economic, organizational and management activities to ensure sustainable high competitiveness of the final products of agrarian-food sector in both domestic and foreign consumer markets.

Agricultural complex is a large and important sector of the economy of Azerbaijan.

Problems of development of the agricultural production of the country has systematic, interdisciplinary, socio-economic features and can only be solved through the development of a set of measures, targeted not only to the proper support and increasing of the economic efficiency of the agricultural production, but

also on socio-economic development of rural areas, improving the living standards of rural people, agricultural workers [18].

Analyzing the existing agribusiness market infrastructure of Azerbaijan and problematic fields of the agribusiness market, we can indicate the following features of regional market infrastructure:

- The lack of centralization of the market services, disconnection of links;
- Isolation of the units from one another, the lack of cooperation and mutual assistance;
- The discrepancy of actual functions must be performed which indicated in the constituent documents;
- Consumer's lack of information about services which provided by the various institutions of the market infrastructure services;
- Lack of support by public authorities for the objects of the market infrastructure;
- Discrepancy existing level of the market infrastructure to the required level of development.

Especially it should be noted that there is a problem of preservation and marketing of inventories in agriculture. The cost of the binding of working capital generated by loss of (potential) benefit from the cash turnover. Such costs are determined as well as possible interests to the capital that is invested in the stock [17]:

$$CH = pK, (1)$$

where  $p$  – is the percentage of charge;

$K$  – is the value of related assets.

Quantitative losses represent evaporation, shrinkage, radioactive decay of raw materials and final products.

The change in the amount is exponential (without material flow):

$$I(t) = I_0 e^{-yt} \quad (2)$$

where  $I_0$  is the initial value of the stock;

$y$  – is loss ratio.

The loss of time ( $t$ ) is

$$C = cI_0(1 - e^{-yt}) \quad (3)$$

At a low value of the relation  $yt$   $e^{-yt} \approx 1 - yt$ , so it is true that  $C = cytI_0$ .

The costs associated with the delivery (purchase of goods, raw materials), can be divided into two parts. The first part is the amount that must be paid to the supplier. It represents the cost of delivered goods. The second part consists of the most cost storage system design and supply implementation. The cost of delivery is included in the product / cost of raw materials or can be paid separately.

The costs for the delivery of the next batch of goods / raw material may depend on the size of the order. Then the cost of the order's average unit will be determined as

$$C_o = \frac{C(q)}{q} \quad (4)$$

Where  $q$ - is the size of the order;

$C(q)$ - is delivery costs, depending on the size of the delivery.

Mainly the costs on deficits appears when the buyer to find the absence of the goods and lost further interest in to its seller (manufacturer) or when there is stopping of the production cycle, due to the lack of parts or materials.

Losses from a deficit is difficult to define and it is more difficult to determine exactly, but they do exist and they must be reckoned with.

When using mathematical methods from the loss of the deficit, it must be calculated in proportion to the level of the integral of the negative reserve. In this case it is assumed that the demand is not reduced.

Methods of inventory management in real-time with an orders of fixed periodicity that providing system adaptation to the changing conditions of production and includes functional of  $L$ , decision rules on the formation of bids for the purchase of the missing inventory items (TMC) from suppliers, which are based on statistical methods, including mathematical model where  $\Delta t_1$ - period, through which the formation of the order;  $\Delta t_2$ - fixed period of testing of critical situations ( $\Delta t_1 > \Delta t_2$ );  $M$ - mathematical model of order.

The proposed procedure for checking the critical situation defined values  $t_m$ ,  $p$ ,  $n$  (day, month, significance level, a list of products); level of inventory values materials (IVM) are calculated with the missing values  $L_t$ ,  $m$  over the past 30 days; the average value level of the missing (IVM)  $L$  are calculated by the formula:

$$\bar{L}_t = \frac{\sum_{n=1}^N L_{t,m}}{n} \quad (5)$$

Month  $t$  is suggested to calculate, as the previous 30 calendar days with the respect to current day of  $m$ . The hypothesis of using  $e$  criteria:

Then put the hypothesis that the probability law of distribution of 0.95  $R_m$  functional figures is normal. On the table are the figures of  $z$

$d_{1-0,5q} < d < d_{0,5q}$ . Then we check the delivered hypothesis by the criteria  $D$ .

$$d = \frac{\sum_{i=1}^n |L_{t,m} - \bar{L}_t|}{\sqrt{n \sum_{i=1}^n (L_{t,m} - \bar{L}_t)^2}} \quad (6)$$



Where  $n=30$ .

If  $d1-0,5q < d < d0,5q$ , then the hypothesis of normal distribution probability  $L_{t,m}$  functional figures in the month  $t$  is consistent with experimental data, and the law of distribution  $R_m$  appears normal.

If the law of the distribution of the level of missing inventories is  $L_t$ ,  $m$  is normal, then calculated the allowable deviation from the mean ( $E$ ) using the Student's  $t$  test:

$$E = t^* \sigma(7)$$

$t$ - Students' criteria with the probability of  $p=0,95$ ,  $n=30$ ;

$$\delta = \frac{\sqrt{n \sum_{l=1}^n (L_{t,m} - \bar{L}_t)^2}}{n-1}.$$

$\sigma$  – standard deviation

(8)

Then check out if the figure obtained new level of inventories of missing IMV are out of range.

$$\bar{L}_t - E < L_{t,m} < \bar{L}_t + E \quad (9)$$

If the level of missing inventories (IMV) is out of range or the distribution law probabilities are not normal, it is applied to regulate the management load warehouse, based on a mathematical model.

Agribusiness complex reforms, structural changes associated with denationalization and privatization, have destroyed the existing integration ties among enterprises of the complex, inter-branch and inter-regional exchange. This led to the violation of the integrity of the Agro-Industrial Complex as a single economic system. Rural producers had problems in obtaining means of production, implementation of business activities and the marketing of products, which is due in no small measure to the deformation of a complex industrial infrastructure [2].

For the development of marketing system of the Agro-Industrial Complex it is necessary investments in the implementation of wholesale markets, the improvement of existing farm storage facilities, inter-regional transport links, the development of market information systems.

All these problems are interconnected and for the elimination of them it is required the effective functioning of many elements of the market infrastructure, therefore, an integrated systems approach to the problem is required.

Innovative development of infrastructure of the agrarian sector



Innovation-oriented model of development of agro-industrial complex requires the implementation of innovations and the use of innovational technologies. It should be noted that we refer to innovations improvements and streamline changes, which cover the entire list of works and results of innovation activities in organizations on the functional areas of activity, as well as in the directions - from raising the technical level and changes in the volume and structure of production till improvements in the activities of this organization, rationalization and improvement of administrative management.

Economic relations between the corporate entities are built on a contractual basis, the natural kind of goods can act as a dividend. Using a centralized finance resources should be based on the following principles: a minimum of gratuitousness; the allocation of funds under the developed programs; compliance of compensatory and equity forms of subsidies; subsidies subject to the terms (growth of labor productivity, sales, etc.), in case of failure it must be returned.

Use of budgetary investments through authorized banks in addition to the advantages of this system also has its drawbacks - there is a possibility of a significant rise in price of resources to producers, using of it by the bank for a long time. Therefore, in this case, the allocation of funds must be approved with the limit margin level and timing of operations. In case of improper fulfillment of the requirements there can be implying of penalties and refunds can be returned.

Agro-industrial corporation or a consortium should provide agricultural producers with reasonable prices and appropriate payments, which agricultural cooperatives cannot provide, because they depend on the processing companies and other customers. Private farms, due to their dispersion and low sales volumes will take their products to the distribution centers.

#### Conclusion

As the survey showed, economic practice and scientific theory have two main arrangement settlements, which are based on a contractual relationship. At the initial stage of development of corporation is advisable to use the first mechanism. This consists of the development and the use of target prices and tariffs for material resources, works and services which provide a refund to objectively necessary (regulatory) production costs. And during corporate transformation of the enterprise to full production and commercial cycle, it is advisable to move to a fundamentally different pricing scheme, which consists in the fact that participants of the corporation set for their products, works and services prices that are average or slightly below than market price level.

This pricing scheme will let to transform to a different principle of profit-sharing, which based on the share of enterprise's products cost in the total cost of the finished products. This scheme can work in such economic conditions that featured by inflation, decline of production, the high cost of funds.

We have developed a model of regional innovation infrastructure, in our view, to improve the efficiency of technological, scientific, information, consultation and other provisions of the agricultural producers.

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